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ABSTRACT

The identification of persons qualified for management positions in supermarkets is the subject of this report based on a master's problem. The overall objective of the study was to develop criteria that would indicate an employee's abilities in leadership, communications, mathematics, and judgment. The development of management training was based on 2 hypotheses: (1) There is a positive correlation between attaining the position of manager and that person's attaining leadership in high school and college activities or sports; and (2) Present managers will score 80% or higher on the Tiffin Lawshe Adaptability Test. Results indicate that the Tiffin Lawshe test can be used by the supermarket industry in selection of persons for training programs; a questionnaire gave an adequate indication of leadership ability; education did influence the test scores; and the test and questionnaire did not take personality, attitudes and goals into consideration. However, the Extension Division of the University could coordinate industry training programs, and one can use scientific principles to arrive at sound, useful, and pertinent information. (RS)

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EMPLOYEE SELECTION CRITERIA FOR TRAINING PROGRAMS

A Report
Presented to
The Department of Extension Education
University of Missouri, Columbia

In Fulfillment of Requirements
For A Special Problem, Extension Education 400 & 450

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by
Richard S. Bostdorff
May 1972

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The following is a report of a study made as a basis for a Master's problem. It is noted that this is in the area of assembling information relative to produce management personnel at retail level. This information is available to anyone, especially those in produce super-marketing. However, any application, interpretation or use is solely at the discretion and responsibility of those using it and not that of the University of Missouri staff or the author.

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National Foods	Nowell's U.S. Super
Kroger	A&P
Wyatts	Shultes IGA West
K-Mart Foods	Dixson's Discount Supermarket
Safeway-Columbia	Temple Stephens Co.
Columbia Bi-Rite	Shultes IGA Whitegate
Gerbes	Schnucks
Eastgate Foodliner	

The author is also grateful to the New York State Orleans County Cooperative Extension Association, the Orleans County Board of Supervisors, and Cornell University for granting the leave which made this graduate study possible.

CHAPTER I - SITUATION

A. THE BACKGROUND

For the present, and the foreseeable future, people must depend on supermarkets to secure their supply of food. From the supermarket shelves the consumers pick and choose the items they need or desire. As the population centers have grown, the number of food centers have, of necessity, increased. In the small city of Columbia, Missouri, the supermarket industry increased in numbers by over one hundred per cent from 1960 to 1971. In the city of St. Louis, Missouri, one chain doubled the number of their stores in the twelve years ending in 1971. According to a supermarket personnel director, "This increase in number of stores has put a tremendous amount of pressure on management to fill supermarket departments with qualified personnel. This is especially true of the position of department manager." [1] The reason for this lack of department managers was that these qualified individuals had been moved into new stores, as they opened, as store managers. Higher level personnel were needed at a rate greater than that at which they were being produced.

This lack of qualified personnel had led both to the "stealing" of personnel from each other and to the recruitment of college students and graduates. As this change took place within a short span of time, few, if any, in the supermarket

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1. From a personal interview.

industry had made plans to alleviate the resultant shortages. Colleges and universities were also caught off guard, and had not been of much help in supplying the necessary qualified personnel. In general, then, this had left the supermarkets with having to promote from within their own ranks. This had proven disappointing for some supermarkets, since some employees had been in the employment of the supermarkets for only a short time, and they lacked experience and knowledge of the industry. The securing of new employees had also been discouraging, for many of the prospective young men were either, 1) in the armed forces, 2) in college, or 3) gainfully employed elsewhere.

Why were desireable people employed elsewhere? Why had they not inquired into the supermarket industry for employment? This problem is not dealt with in this paper; however, it is important to note here that the supermarket industry, besides having a management problem, had an image problem. This image problem, although expounded upon by several industry leaders such as Mr. Ed Schnuck, President of Schnucks Stores, and J.T. Wyman, President of Super Valu, is best illustrated by the following chart. The source of this chart is a thesis paper entitled, "Why MBA's Do Not Select a Career in Retailing" presented to the Harvard Business School in April, 1965.

TWO VIEWS OF RETAILING

Characteristics	Retail executives rated retailing for listed characteristics as follows:	MBA students rated retailing for listed characteristics as follows:
Image and status	Changing, but still fairly low	Low
Family domination	Becoming less of a factor	High
Importance of education	The more retailing progresses, the more the requirement for sophisticated techniques	Of little importance
Advancement	High, great need for qualified people	Low
Salaries	Comparable at some schools, lower than average at others	Lower than school average, lower than other fields
Work nights/ Saturdays	A person must work hard to get to the top	Would expect to work as hard at any other job
Opportunities for creativity and initiative	High	Low

2. "The Crisis in Management Development," Food Topics, XXII,1 (January, 1967), p. 12.

This being true, then the identification of management people already within the industry was of real importance.

The management of the produce department was more critical than that of some of the other departments of a supermarket, because of the perishability of the items handled. It was necessary that these managers apply good judgment to prevent spoilage from mishandling, faulty storage, or improper trimming. Since they ordered produce usually once a week, they needed to be cognizant of consumer shopping habits, the effects of seasons, and the occurrence of holidays so that there was no loss due to overages and that customers were not left without because of shortages. The manager's knowledge of quality versus price was critical to maintaining product flow. The ability to reason through the department historical data in projecting weekly and monthly sales was necessary to the produce manager. David Bartz, in the February, 1970 issue of Supermarketing listed the four parts of sales projecting as:

"1. Assemble the historical sales data.

"2. Make the sales forecast.

"3. Audit the forecast by comparing the sales forecast with actual sales.

"4. Study the results and measure degrees of varience between the estimate and actual sales." [3]

From the dimensions mentioned above, it was obvious that a produce manager needed to possess the abilities to

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3. David Bartz, "Projecting Produce Sales," Supermarketing, XXV, 2 (February, 1970), p. 55.

reason deductively, use mathematics, and communicate. It might be noted here that one supermarket chain had drawn five company vice-presidents from their produce managers in the fifteen years prior to the writing of this paper.

B. THE PROBLEM

One quickly observes that people who were qualified for management positions were not easily identified or procured. Identifying these people was the weakest link in obtaining replacement personnel for management positions. In the supermarket industry were found the small, individually owned store and the huge national chain store organization, with several variations in between. Most stores did not have a personnel department which could help with employee evaluation and training. A survey of the stores in Columbia, Missouri, revealed only four of the fifteen major supermarkets with personnel departments within their organization; in this case these were the four major chain stores in the city. Even where these personnel departments did exist, the selection of persons for positions was not easy. The problem was: there existed few, and in most cases no, criteria for selecting employees from within department ranks for managerial training programs where decisions were made upon short time exposure to the employee.

C. THE OBJECTIVES

The over-all objective of this study was to develop criteria that would indicate an employee's abilities in

leadership, communications, mathematics, and judgment. These areas were agreed on by one supermarket chain owner, three personnel department heads, and seven store managers as being important in the selection of employees for training programs and advancement.

Further Objectives.

1. To establish Tiffin-Lawshe Adaptability Test score norms for local produce department managers.
2. To provide a meaningful and reliable tool for supermarket owners, store managers, and personnel departments to use in the selection of employees for training programs.
3. To provide data as a basis for new Extension programming with supermarket businesses on local and/or regional and/or statewide levels. It would appear that these indicators would apply to any business as long as the desired variables were the same as in this report. This would broaden considerably the possible Extension audience.
4. To serve as a basis from which to develop employee training programs for the supermarket industry to strengthen identified weak areas in communications, mathematical ability, and judgment (deductive reasoning ability). Again, other industries might also be included.
5. To learn application of scientific principles and methodology through the employment of a research instrument and the execution of a research project.

CHAPTER II - REVIEW OF LITERATURE, HYPOTHESES, AND ASSUMPTIONS

A. STUDY VARIABLES

The need for criteria had been pointed out by several people. George L. Baker, Jr., Director of Education for Supermarket Institute said in Food Topics, January, 1967, "... and the young people must buy a pie-in-the-sky because supermarket companies in general offer little specific formal training beyond the store manager level. Generally such training as there is is not too meaningful - there are no job descriptions, no performance evaluations, no recognition." [4] In the same article, David Silverberg, General Manager of Wakefern Foods said, "The great challenge to us as trainers (is to) attract and develop great numbers of capable people from the school --- and train talented people in our own ranks." [5] A vice-president of National Foods once pointed out that if he looked at a company and their management at all levels came primarily from outside, they did not have good selection standards and had not been able to develop the people they needed.

Probably W.N. Mitchell in an article entitled, "What Makes a Business Leader" said it best, "Everyone in a position

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4. "The Crisis in Management Development," Food Topics, XXII,1 (January, 1967), p. 12.

5. Ibid., p. 14.

of authority must judge people and their potential for growth as a part of their job; administrators perforce are always sizing up subordinates in hiring staff, in fixing compensation levels, in recognizing progress by promotions. Unfortunately these administrators have few truely objective standards to guide them." [6]

The need for this kind of criteria was a present one with nearly every supermarket organization across the country. A check with Columbia, Missouri, supermarkets substantiated this fact. Since several of the large supermarkets had training programs, early detection of a person with management abilities would help in two ways. First, it would get these individuals started up the management ladder, thus preventing their loss due to stagnation and discouragement. Second, training was expensive; why train everyone when, if criteria were available, those with potential only could be trained? And why train in all areas when, with criteria, the weak areas could be isolated?

If criteria were to be useful, the factors to be included were those upon which store owners and managers agreed to be important, understandable, and useful to them. Many variables were considered:

1. Goals - personal and company
2. Leadership ability
3. Business ability

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6. W.N. Mitchell, "What Makes a Business Leader?." Personnel, May-June, 1968, p. 56.

4. Communications
5. Attitude
6. Personality
7. Mental ability
8. Mental capacity
9. Creativity

From this list two variables were selected for study. These two variables were leadership ability and mental ability. These were chosen for two reasons. First, neither leadership ability nor mental ability were easily assessed by interview. Second, the results of tests given to determine the extent of these abilities could also give indications of strength or weakness in other areas.

B. LEADERSHIP

As in any organization, if it is to function efficiently, effectively, and profitably, the supermarket business must have people with leadership ability. C.A. Gibb said, "... it may be said that leadership is a concept applied to the structure of a group to describe the situation when some personalities are so placed in the group that their will, feeling, and insight are perceived to direct and control others in the persuit of common ends." [7] One might liken the produce manager to any person involved in a leadership role of an extra-curricular activity in high school or college.

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7. C.A. Gibb (ed.), Leadership (Bungay: The Chaucer Press, 1969), p. 214.

They were chosen as leaders for many reasons. They also had characteristics which were agreed upon by a number of authorities. Percey E. Arthur, [8] George C. Bellingrath, [9] and C.A. Gibb [10] agreed on the following characteristics: moral character, self-discipline, selflesness, self-sacrifice, tolerance, enthusiasm, sense of responsibility, humaneness, dignity, intelligence, honesty, alertness, self-confidence, motivation, industriousness, likeability, agressiveness, and adaptability. The last seven items were statistically significant.

C. LEADERSHIP HYPOTHESIS

Therefore, if a produce manager was, in essence, a team leader, then the hypothesis concerning leadership stated: There is a positive correlation between a person's attaining the position of produce manager and that person's shown leadership attainment in high school or college sports and/or extra-curricular activities.

D. ASSUMPTIONS

The above hypothesis was based on the following assumptions:

1. That all produce department managers would have a

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8. Percey E. Arthur, You Are The Captain (Austin: the Steck Co., 1963), pp. 6-20.

9. George C. Bellingrath, Qualities Associated with Leadership in the Extra-Curricular Activities of the High School (New York: Columbia University Press, 1930), pp. 16-17.

10. Gibb, op.cit., p. 311.

minimum of three years of high school education, and that some managers would have one or more years of higher education.

2. That the produce department was a team of which the department manager was the team leader. A team was considered as a group of two or more people.
3. That since produce managers were team leaders, they had acquired their leadership skill by participating in school sports or extra-curricular activities.
4. That produce managers were not born leaders, but had learned these qualities over a period of time.

E. MENTAL ABILITY

The second variable chosen was mental ability. In attempting to define mental ability, one does best to list the primary mental abilities. According to Thurstone these were:

"1. Verbal ability, reflected in facility with words and language.

"2. Numerical ability, required in the simple arithmetic operations, but not in the more complex reasoning types of situations.

"3. Memory ability, characterized by recall of recently learned, rote memory material.

"4. Visualizing ability, required in the performance of tasks involving space relationships.

"5. Mental fluence, required in the making of rapid responces or adjustments to abstract tasks.

"6. Perceptual speed, required in the rapid identification of differences in visual patterns.

"7. Inductive reasoning ability, required in the discovery and application of some rule or principle that is operating in a situation.

"8. Deductive reasoning ability, representing what is most often popularly referred to as reasoning ability." [11]

Through the same process as for leadership ability, it was determined that verbal ability, mathematical ability, and deductive reasoning ability were the most important variables to be considered for the position of produce manager. Mr. R.W. Adams in his book, The Complete Employee, also pointed out that being able to express oneself with the correct words influences one's ability to think more accurately. [12] Certainly part of getting this team to work was motivation and education; if the manager could not express himself accurately through written or verbal communication, the team would fail to function efficiently.

Mathematical ability is the ability to use numbers as a language. In most cases the produce business has been a game of numbers. Orders are filled, prices determined, time sheets validated, balance sheets kept, other jobs

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11. Charles H. Lawshe, Jr., Principles of Personnel Testing (New York: McGraw-Hill Book Co., 1948), p. 55.

12. Robert Winthrop Adams, The Complete Employee (Chicago: Public Administration Service, 1959), p. 2.

necessitated, all completely or partially related to the use of numbers. A supermarket personnel director pointed out that, "A person can learn mathematics. However, there must be the ability within a person to work with numbers." [13] In two subjective employee evaluation sheets being used in produce departments at the writing of this paper, five of the items were either directly or indirectly associated with mathematical ability. The criteria developed in this program were to measure the area of mathematical ability in terms of objectivity, not subjectivity as was being done at this time.

Deductive reasoning ability was probably one of the more important factors. The rapidity of change and the quick judgments that were needed made the ability to reason essential. Charles W. Lytle listed three points as important when dealing with people: judgment, ability to develop subordinates, and personal efficiency. [14] Frank E. Weakly also stressed that the ability to reason in an orderly fashion was essential, and that the only real way of determining this was through testing. [15]

Many tests existed for determining mental ability, but one seemed to be most applicable to the produce manager. This was the Adaptability Test developed by Joseph Tiffin and C.H. Lawshe, Jr. It was a short test - fifteen minutes - and it did an adequate job of indicating a person's mental abilities, especially those previously outlined. This test

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13. From a personal interview.

14. Charles W. Lytle, Job Evaluation Methods (New York: The Ronald Press Co., 1946), pp. 84-87.

15. Frank E. Weakly, Applied Personnel Procedure (New York: McGraw-Hill Book Co., 1923), p. 26.

had been used in the Navy electrician program quite successfully. The Army had used it in the past as a selection method for personnel for specific jobs. A relationship had been found between an individual's score on this test and his position two and one-half years after the test was taken.[16] Anne Anastasi and Marion Bills, in the Mental Measurement Yearbook wrote that the Adaptability Test was a good instrument in helping to identify persons who should be placed in jobs requiring rapid learning and/or the development of independent judgment.[17] This test had been validated extensively, and a score criteria set up for other industries.

F. MENTAL ABILITY HYPOTHESIS

Based on the scoring system in use at the time this paper was written for the Adaptability Test, the hypothesis concerning mental ability stated: That present produce managers, based on the norms of similar positions in other industries, will score eighty per cent or greater on the Tiffin-Lawshe Adaptability Test.

G. ASSUMPTIONS

The above hypothesis was based on the following assumptions.

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16. Marion A. Bills, "Relation of Mental Alertness Test Scores to Position and Permanancy," Journal of Applied Psychology XXVII, 1943, pp. 154-156.

17. Oscar Buros (ed.) The Third Mental Measurement Yearbook, Vol. 3 (New Brunswick: Rutgers University Press, 1935), p. 294.

1. That if a produce manager could not express himself verbally to his superiors, his supply people, his customers, and the employees under him, his department would reflect this in producing less than his expected share of the per cent distribution for that department.
2. That since all produce managers did some or all of the product ordering, pricing of produce, setting of department employees' work schedules, keeping of product flow sheets, as well as staying within set budgets, it was necessary that they have a working knowledge of numbers.
3. That since the produce department manager was responsible for the activities of his department, it was necessary that he be able to reason rapidly through problems based on the conditions that existed, and to reach equable decisions.

CHAPTER III - DEFINITIONS

It would be well to define several terms as they relate to this paper.

Team leader - That person hired, elected, or appointed as the one to direct the activities of a group of people. In this paper the produce manager is defined as a team leader.

Extra-curricular activities - Those organized and school-recognized activities that are joined into for non-credit during a person's school life. These would include such activities as class officers, science clubs, math clubs, Future Farmers of America, music groups, etc. It does not include groups or activities outside the school such as lodges, community service clubs, etc.

Produce Department Manager - That person who has been hired by a supermarket firm to be responsible for, and to direct the activities of, that department and the employees thereof in a manner that will be economically profitable for the employing firm.

Working knowledge - That level of acquired knowledge that allows a person in a given position to work efficiently and accurately.

Mathematical ability - The capacity to use numbers as a language.

Verbal ability - The ability reflected in facility with words and language, whether spoken or written.

Deductive reasoning ability - That ability representing what is most often referred to as reasoning ability, or consecutive logical thinking.

Leadership - For this paper the definition used is C.A. Gibb's, "... it may be said that leadership is a concept applied to the structure of a group to describe the situation when some personalities are so placed in a group that their will, feeling, and insight are perceived to direct and control others in the persuit of common ends." (see footnote page 9)

Supermarket - A departmentalized retail market, where a management organization exists and each department has an identifiable person in charge of its operations, this person having the title of department manager. *

* Therefore, "Mom and Pop" stores and the "Quick" or "24 Hour Quick Shops" are excluded.

CHAPTER IV - RESEARCH SCOPE AND DESIGN

A. THE POPULATION

One hundred per cent of the produce managers from one hundred per cent of the supermarkets in Columbia, Missouri, were included in the project. This included fifteen supermarkets and their produce managers. Columbia, Missouri, was unique in that it contained nearly every type of supermarket - the individually owned single store, the small chain store, and the large national chain store. Of the three types of supermarkets, no one group, by sheer numbers, was over or under represented. The population and location of Columbia were also important, as only a metropolitan area could offer the complete industry representation.

B. DESIGN OF INSTRUMENTS

Two instruments were used, a questionnaire and a timed standard test. Both were designed to be short while covering the area of interest adequately.

The Questionnaire. The questionnaire had two sections. The first ten questions dealt with personal and job background. The last four questions covered activities participated in by the managers during their years of formal education.

It will be noted that only sophomore, junior, and senior years of high school and college were included. There

were three reasons for this differentiation:

1. Generally the freshman year was a weeding-out year. The student was beginning a phase in his life in which he encountered real competition. He soon recognized whether or not he could participate in extra-curricular activities and sports while achieving his education. The student who could not, generally did not engage in many sports or join in many extra-curricular activities after his freshman year.
2. Varsity sports held more prestige, and freshmen were not allowed to play varsity sports.
3. Generally the freshmen in an organization were not allowed to hold an office. Office holding and leadership qualities were equated.

This questionnaire was pre-tested on twenty graduate students at the University of Missouri, Columbia. This group approximated the age range of the produce managers. The questionnaire was then re-worked and printed. A copy is included in the Appendix.

The Standard Test. The Adaptability Test was developed by Joseph Tiffin, PhD and C.H. Lawshe, PhD. Since it was known to indicate strengths and/or weaknesses in the areas concerned in this project, it was not pre-tested.

The Adaptability Test was chosen over other possible tests for two reasons:

1. It had reliability and validity in the three areas of interest, a) verbal communications, b) mathematics, and

c) deductive reasoning.

2. It was short. The maximum time allowed a participant was fifteen minutes. Time was critical in gathering the required material, since managers participated on company time. Also, most managers were under Christmas rush pressure; therefore, they had more work scheduled than normal.

A copy of the Adaptability Test will be found in the Appendix.

C. COLLECTION OF DATA

The collection of data required a minimum of two steps, and a maximum of three steps, depending on the supermarket involved. The two step process, which was the most frequent, included: 1. Meeting the store manager and explaining the program, its purposes, and its ultimate goals. After securing his cooperation, a date was set with the produce manager for the administration of the test.

2. Administering the questionnaire and the timed exercise to the produce manager.

In the cases where three steps were involved in the process, the first and third steps remained the same. The second step required obtaining permission from the head of the personnel department of the company.

Past Cooperative Extension programs conducted by the Retail and Wholesale Economist on the Agriculture Economics staff at the University of Missouri, Columbia were of great help. The personnel of stores which had never participated

in Extension programs were hesitant, and several meetings were necessary before permission was obtained.

The author personally conducted the collection of data from all participants. The collection was accomplished during the second weeks of December and January. The collection of data required a minimum of one-half hour of time. The procedure was as follows:

1. Five minutes - devoted to an explanation of the program, its purposes, and the relation of the questions to the future of the supermarket industry.
2. Five minutes - completion of the questionnaire.
3. Seventeen minutes - administration of the timed exercise. This included a two minute explanation at the beginning of the test.
4. Following the completion of the timed exercise, time was available for the discussion of the questionnaire and test or for a discussion of produce problems in general.

CHAPTER V - GENERAL CHARACTERISTICS OF THE POPULATION

In order that the reader might better understand the population involved, and thus the results obtained in this study, a general description follows. The total population of produce managers equaled fifteen (N=15).

A. AGE

The age range was from nineteen to sixty, with a mean age of 34.5 years and a median of twenty-nine years. In this report the median gave a truer picture than did the mean.

Table 1

Number and Percentage of Respondents

Classified by Age

Age Range in Years	Number	Percent
19-29	8	53.33
30-40	2	13.33
41-60	5	33.33
Total	15	100.00

B. EDUCATION

The years of formal education completed by the produce managers ranged from nine to sixteen. The mean number of years was 12.2 and the median was 12.0.

Table 2

Number and Percentage of Respondents

Classified by Years of Education

Years of Education	Number	Percent
16	2	13.33
14	2	13.33
13	2	13.33
12	4	26.68
11	2	13.33
9	3	20.00
Total	15	100.00

C. YEARS AS PRODUCE MANAGER

Members of the group studied had been produce managers from one month (1/12 year) to 27.5 years. The mean was 5.13 years, and the median was 2 years. Again, the median gave a truer picture of the situation that did the mean. There were nine participants who had been produce managers two years or less.

D. YEARS ASSOCIATED WITH PRODUCE BUSINESS

The number of years that the participants had been associated with the produce business ranged from one month (1/12 year) to 27.5 years. The mean was 7.82 years, and the median was 7.0 years.

E. FATHERS' OCCUPATIONS

There were only two managers whose fathers had been in the grocery business; none had been directly connected with the produce business. Therefore, the population came from family backgrounds other than that of the produce business. The family backgrounds included a grain farmer, truck drivers, postal clerks, and mechanics.

CHAPTER VI - FINDINGS

A. RESULTS OBTAINED ON TIFFIN-LAWSHE ADAPTABILITY TEST

The first comparison made was between established difficulty norms for the Tiffin-Lawshe Adaptability Test and the results obtained from the study population. The following chart illustrates that the study population consistently did not do as well on any group of questions as the established norm.

Table 3

Average D-Values and Difficulty Levels for Adaptability Test Form A

Part of Test	Average D-Value	Average % Answered Correctly	Produce Managers % Answered Correctly
First 10 Questions	0.9	86	78.66
First 20 Questions	1.0	75	64.33
First 30 Questions	1.0	64	55.06
Total 35 Questions	1.0	55	47.45

The norms of this test had been established by testing a wide range of people and occupations. Some of the occupations involved were Navy trainees, clerical workers, route salesmen, engineers, industrial superintendents, female and male factory workers, general office employees, and top and middle management.

Dr. Carl Willis, Coordinator of Testing and Counseling, University of Missouri, Columbia, based on his professional opinion, indicated what each question on the Tiffin-Lawshe Adaptability Test had been designed to measure - communication ability, mathematical ability, or deductive reasoning ability.

The following chart represents the results obtained in this study as to total score, and to each area that was represented. It will be noted that as the test scores decrease, individual scores on communications, mathematics, and deductive reasoning tend to fluctuate and do not follow a straight line. This difference in scores on the various areas of the test supports the ability of the instrument (Adaptability Test) to indicate weak areas. If the scores on the individual areas had remained steady, without fluctuation, it could be reasoned that this test could not differentiate between mathematics, communications, and deductive reasoning.

Table 4

Results Obtained on Tiffin-Lawshe Adaptability Test

Test Score	Math Score	% Correct	Comm. Score	% Correct	Ded. Reason. Score	% Correct
29	6	100.00	13	86.67	10	71.43
24	5	83.33	11	73.33	8	57.14
23	5	83.33	11	73.33	7	50.00
22	5	83.33	10	66.67	7	50.00
21	3	50.00	11	73.33	7	50.00
19	5	83.33	8	53.33	6	42.86
19	3	50.00	10	66.67	6	42.86
17	5	83.33	7	46.67	5	35.71
17	4	66.67	9	60.00	4	28.57
16	2	33.33	7	46.67	7	50.00
13	2	33.33	7	46.67	4	28.57
10	1	16.67	5	33.33	4	28.57
8	2	33.33	3	20.00	3	21.43
6	2	33.33	2	13.33	2	14.29
5	2	33.33	2	13.33	1	7.14

The mean score of this group was 16.6, which was equal to 47.7 per cent of the questions answered correctly. Therefore, the mental ability hypothesis was not supported. The produce managers did not score eighty per cent or greater on the Adaptability Test. The mean of 16.6 is nearly identical to the norm mean established for the lowest level of

the "Trades and Professions" category. Based on past experience, those scoring sixteen plus or minus five were best adapted to a route salesman type position. The score of sixteen also denoted people who, "may be placed on jobs requiring little opportunity for independent thinking, and average adaptability to a new situation. This group includes the average employee." [18]

Based on the norms established over a period of thirty years and the nearly exact fit of produce managers in this study to the established norms, those scoring sixteen or better had the ability to be department managers or better. Taking the standard deviation into account, 1.6 for mathematical ability, 3.5 for communication ability, and 2.4 for deductive reasoning ability, those scoring thirteen, fourteen, or fifteen had the ability to be assistant managers, but probably no better than department managers. Those scoring five to twelve, according to the Examiner's Manual, "may be placed on jobs which are mostly routine and do not require independent thinking. Persons in such jobs frequently are below average in ability to understand directions and need step by step instruction for most tasks." [19]

At the other end of the scoring scale, those scoring twenty-four through twenty-nine, "may be placed on jobs requiring some independent thinking. Persons in such jobs

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18. Joseph Tiffin and C.H. Lawshe, Examiner Manual for the Adaptability Test (Chicago: Science Research Associates, 1954), p. 8.

19. Ibid.

usually learn quickly and understand instructions readily." [20] This group included supervisory positions. Taking into consideration standard deviation for each area as mentioned earlier, a score of twenty-nine meant, "all other things being equal, such persons may be placed on jobs offering opportunity for originality and independent thinking. Those in this bracket tend to be superior on jobs involving verbal and numerical facility." [21] This group included executives and junior executives.

B. RESULTS OBTAINED ON LEADERSHIP QUESTIONNAIRE

Questions ten through fourteen on the Leadership Questionnaire were evaluated on a weighted points scale basis. The points were distributed as follows:

0 - no participation

1 - participation only

2 - attainment of any office other than vice-president, co-captain, president, or captain

3 - attainment of office of vice-president or co-captain

4 - attainment of office of president or captain

The total possible points for the highest level of attainment (captain or president) over the longest period of educational time (six years) equaled twenty-four points per activity. Since the nature of the activity was not pertinent, so long as it was recognized by the institution, quick tabulation resulted. The following was the matrix used for leadership

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20. Ibid.
21. Ibid.

evaluation.

Table 5

Matrix for Leadership Evaluation

Level of Attainment	Years Participated					
	1	2	3	4	5	6
No participation	0	0	0	0	0	0
Participation only	1	2	3	4	5	6
Held office other than vice-president co-captain president captain	2	4	6	8	10	12
Held office of vice-president co-captain	3	6	9	12	15	18
Held office of president captain	4	8	12	16	20	24

There was a positive relationship between leadership points and years of education. Those exposed to more years of education tended to gather more points. However, this was also effected by age. The following chart illustrates this point.

Table 6

Relationship of Leadership Points to Years of Education and Age

Years of Education	Activity Points	Age
9	0	55
9	0	46
9	0	45
11	0	60
11	1	39
12	2	50
12	11	29
12	8	19
13	6	34
13	17	29
13	17	22
14	8	21
14	18	23
16	20	24
16	21	27

Therefore, the Leadership Hypothesis was supported. There was a positive correlation between a person's shown leadership attainment in high school and college sports and/or extra-curricular activities.

A possible explanation for the occurrence of more leadership points among the younger managers could be directly related to the availability of activities during

their school years. The number of activities had increased over the years with the increase in size of high schools and universities. Also those persons who were forty years old or older were more likely to have had definite home responsibilities during their school years than were those younger men; such responsibilities might have left little time for extra school activities. The absence of leadership points was not to be taken as lack of ability if, in reality, the person had had limited access to the opportunity to garner points.

However, the leadership point system remained a strong point for young managers. Their ability to participate in school activities while obtaining the education necessary to score average or above on the Adaptability Test indicated that they had the mental ability to accomplish several objectives during a single time span.

C. FURTHER EVALUATION

It is important to understand possibly why those scoring five to ten on the Adaptability Test (the four lowest scores) were not really qualified for management type work. The following is not intended to imply that through personal desire and hard work these persons could not function as department managers. It is suggested, however, that if there is a choice, and if one has limited funds for employee training purposes, the higher scoring individual brings with him a higher level of ability in the four areas of interest

covered in this paper.

The following chart compares the four men with the highest scores on the Adaptability Test with the four lowest scoring men. It is important to observe that in no instance did any one of the lower scoring individuals answer more than one-third of the questions in any one category correctly. The low activity score was discussed earlier; these men were in the age group offered few outside activities during their school years.

However, the two important columns list years in the produce business and years as produce managers. The four lowest scoring individuals had been in the produce business from seven to 27.5 years, while they had been managers from two to 27.5 years. These people were in the produce business up to eight years before being moved into management positions. It is projected here that they would not have moved then if better qualified individuals had been available to fill these positions. On the other hand, the four persons with the highest scores generally moved into management positions within eighteen months after they started in the produce business. It is projected here that higher management recognized some abilities in these men, and therefore they were promoted. This is not to say that their moves were not influenced by the lack of more experienced people in the industry.

Table 7

Highest Scoring Four Individuals Versus Lowest Scoring Four Individuals on Adaptability Test

Test Score	Math %	Comm. %	Ded. Reas. %	Activ. Points	Years Educ.	Years Prod. Bus.	Years Prod. Mgr.	Age
29	100	87	71	8	14	.5	.5	21
24	83	73	57	20	16	1	.66	24
23	83	73	50	21	16	2	.83	27
22	83	67	50	17	13	4	1.5	24
10	16	33	29	0	9	27.5	27.5	46
8	33	20	21	0	9	15	7	45
6	33	13	14	0	12	9	2	50
5	33	13	7	0	9	7	6	55

The group with scores clustering around the mean (16.6) was not included in this comparison. It has already been determined that they had the ability to be department managers if their weak areas were corrected through training programs. It would be less expensive to procure new personnel for department manager positions through the use of the criteria set up in this paper than to train the lower scoring group. The lower scoring group lacked the ability to cope with the industry-agreed necessities of mathematical ability, communication ability, and deductive reasoning ability.

It seemed logical that to be able to function in

the three ability areas, one needed a high school education. Three of the four lowest scoring individuals had only nine years of formal education. It became obvious that years of experience did not take the place of years of education, since there was a definite difference in test scores - 5, 6, 8, and 10 versus 22, 23, 24, and 29.

CHAPTER VII - CONCLUSIONS

The following conclusions were reached based on the results of this study:

1. That the Tiffin-Lawshe Adaptability Test was a useful tool for indicating a person's abilities in mathematics, communications, and deductive reasoning. Therefore, it could be used by the supermarket industry in the selection of persons with potential for training programs which lead to positions of department manager or higher.

2. That the leadership questionnaire form used in this study was an adequate tool to determine a person's past leadership achievements. The point score arrived at from leadership activities would give one an adequate indication of a person's leadership ability.

3. That education was important and that it did influence the test scores.

4. That the test and the questionnaire gave only an indication of a person's abilities in mathematics, communications, and deductive reasoning. They did not take into consideration personality, attitudes, and personal and company goals. Therefore, they were not the only tools necessary to the evaluation of an employee for participation in training schools.

5. That, based on the tested population of produce managers, a score of sixteen or better would be considered acceptable for the position of produce department manager.

6. That Cooperative Extension at the University of Missouri, Columbia, especially the Department of Agriculture Economics, the Department of Extension Education, and University Wide Extension, could coordinate the necessary training programs needed by this industry to strengthen weak areas identified by the Tiffin-Lawshe Adaptability Test. Within the Extension organization people with expertise in the areas of interest could be made available to lead training sessions.

7. That through the application of scientific principles and methodology, i.e. studying the existing situation, defining the problem, locating and adapting past research, etc., one could arrive at sound, useful, and pertinent material.

CHAPTER VIII - IMPLICATIONS

A. LIMITATIONS

It was recognized that there were many towns and cities in the state of Missouri, and that this report was applicable only to Columbia, Missouri. In a study such as this, each community had its own uniqueness in population and composition. Since the inhabitants of a community were generally also the businessmen, it was recognized that each town or city should be treated as an individual case until such time that a cross-section of the nation could be tested and norms established. This was not practical for this study, since the thrust of this program was to identify the tools upon which this process could rely.

The results in this report, therefore, were not to be applied to supermarkets' management outside the city of Columbia, Missouri. Once other areas had been tested and analyzed, this report could be used to correlate Columbia with other areas.

Another limitation was the fact that these criteria gave indications of a person's abilities in only the four areas of the study. These did not purport to be the total answer to personnel selection for training activities. There were other considerations such as personality, inductive reasoning ability, attitude, personal and company goals,

and creativity which were not taken into consideration in this study.

B. POSSIBILITIES

Although this study was limited to supermarket produce department managers, the use of the criteria was not so limited. It was observed by the author during conversations with six store managers that all departments had approximately the same personnel profile as to age, experience, and years in company employment. As such, the data gathering devices were applicable to all departments.

The author believed that these criteria would be helpful to any employer whose managers or other employees needed the variables tested in the performance of their work.

Eventhough the project was carried on in Columbia, Missouri, the supermarket industry in other areas and states was also involved in rapid expansion programs. The variables identified in this report were not unique to Columbia supermarket management. All supermarkets dealt with these variables in management; therefore, the instruments used could be applied to the industry no matter what the location. The inclusion of one hundred per cent of the supermarkets in Columbia in this study further supported the possibilities of wide application.

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APPENDIX

QUESTIONNAIRE

1. Name_____ 2. Date_____

3. Age_____ 4. Father's Occupation_____

5. Years in Produce Business_____

6. Present Position: Department Manager____ Assistant Department Head____ Employee____

7. How Long in Present Position_____

8. Previous Occupation_____

9. Years of High School_____ College_____

10. Name of Store_____

11. Did You Participate in High School Sports? Yes____ No_____

(please list only 10th, 11th, and 12th grades)

Sport	Grade Participated			Captain	Co-Captain	Years This Office Held		
	10	11	12			10	11	12
(a)_____	—	—	—	_____	_____	—	—	—
(b)_____	—	—	—	_____	_____	—	—	—
(c)_____	—	—	—	_____	_____	—	—	—
(d)_____	—	—	—	_____	_____	—	—	—

12. Did You Participate in High School Extra-Curricular Activities Other Than Sports? Yes____ No____

(please list only 10th, 11th, and 12th grades)

Activity	Grade Participated			Office Held	Years This Office Held		
	10	11	12		10	11	12
(a)_____	—	—	—	_____	—	—	—
(b)_____	—	—	—	_____	—	—	—
(c)_____	—	—	—	_____	—	—	—
(d)_____	—	—	—	_____	—	—	—

-2-

13. Did You Participate in College Sports? Yes____ No____

(please list only Soph., Jr., and Sr. years)

Sport	Year Participated So.	Jr.	Sr.	Captain	Co-Captain	Year This Office Held So.	Jr.	Sr.
(a)_____	___	___	___	_____	_____	___	___	___
(b)_____	___	___	___	_____	_____	___	___	___
(c)_____	___	___	___	_____	_____	___	___	___
(d)_____	___	___	___	_____	_____	___	___	___

14. Did You Participate in College Extra-Curricular Activities Other Than Sports? Yes____ No____

(please list only Soph., Jr., and Sr. years)

Activity	Year Participated So.	Jr.	Sr.	Office Held	Years This Office Held So.	Jr.	Sr.
(a)_____	___	___	___	_____	___	___	___
(b)_____	___	___	___	_____	___	___	___
(c)_____	___	___	___	_____	___	___	___
(d)_____	___	___	___	_____	___	___	___

form A

ADAPTABILITY TEST

by Joseph Tiffin, Ph.D., and C. H. Lawshe, Ph.D.

SRA Science Research Associates, Inc., 259 East Erie Street, Chicago, Illinois 60611
A Subsidiary of IBM

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FORM A

1. The statement, "There is something in the way he deals that makes me want to cut the cards," indicates what on the part of the speaker?
   (1) indecision (2) scorn (3) fear (4) hate (5) suspicion ..... (_____)

2. The statement, "No one is able to stop me; I will do that which I intend to do or die in the attempt," indicates what on the part of the speaker?
   (1) determination (2) loneliness (3) ambition (4) rage (5) hypocrisy ..... (_____)

3. What is the first letter of a three-letter word meaning money collected by the government? ..... (_____)

4. In the following series of numbers, how many times does 2 follow 3?
   5 3 2 7 3 2 9 3 2 6 2 8 3 2 ..... (_____)

5. Which of the following multiplications is right?
   (1) $6 \times 23 = 148$ *(2)* $3 \times 59 = 158$
   (3) $6 \times 56 = 316$ *(4)* $7 \times 85 = 595$
   (5) $3 \times 82 = 236$ ..... (_____)

6. The temperature in a tool shed is 18 degrees above zero and the temperature outside is 6 degrees below zero. How many degrees difference is there between the two temperatures? ..... (_____)

7. Which of the following words makes the truest sentence? A father is always (?) than his son.
   (1) heavier (2) older (3) taller (4) wiser (5) younger ..... (_____)

8. Which of the following pairs of words have the SAME meaning?
   (1) prohibit—allow (2) tonic—stimulant (3) wary—foolhardy
   (4) recent—ancient (5) ferocious—mild ..... (_____)

9. What is the first letter of a five-letter word meaning extra money paid at the end of a work period? ..... (_____)

10. Which of the following pairs of words have OPPOSITE meanings?
    (1) transient—permanent (2) comfort—console (3) enraged—angry
    (4) augment—increase (5) kingly—regal ..... (_____)

11. John earns $20 a week. John earns twice as much as Harry earned before Harry had his salary doubled. How much per week does Harry earn? ..... (_____)

12. Which of the words below does NOT belong in the list?
    (1) rabbit (2) whale (3) muskrat (4) seal (5) fox ..... (_____)

13. A stool has four legs 21 inches, 20½ inches, 20 inches, and 22 inches long. What is the smallest total number of inches that must be cut from the legs to make the stool level? ..... (_____)

14. What is the first letter of a fourteen-letter word meaning a person in charge of a plant? ..... (_____)

15. A workman was making $2.40 per day. His wages were raised to $3.30 per day making a raise of 15 cents an hour. How many hours per day was he working? ..... (_____)

16. SOUND is to SILENCE as SUNLIGHT is to:
    (1) evening (2) moonlight (3) night time (4) twilight (5) darkness ..... (_____)

17. George drives 18 miles to work. George drives three times as far as Tom did before Tom moved two miles closer to the plant. How far does Tom drive to work? ..... (_____)

18. What number is missing in this series?
    5 — 7 — 10 — 14 — 19 — (?) ..... (_____)

19. What is the first letter of a nine-letter word meaning a talk with a hiring official?..... (_____)

20. A certain letter is the fifth letter before "M" in the alphabet. Another letter is the third letter after "M" in the alphabet. What letter is midway between these two letters? ..... (_____)

21. If the words below were arranged to make the best sentence, with what letter would the last word of the sentence end?
employees cooperation many poor fail causes to..... (_____)

22. BLUEPRINT is to BUILDING as PATTERN is to:
(1) sewing machine (2) dressmaker (3) dress (4) foundation (5) cloth..... (_____)

23. If the words below were arranged to make the best sentence, with what letter would the last word of the sentence end?
tools have workmen good not dull do..... (_____)

24. A man spent $15.00 or 5/8 of his check for room and board. How much was his check?..... (_____)

25. Which of the following pairs of words have the SAME meaning?
(1) tart—acid (2) waste—conserve (3) enthusiasm—ennui
(4) cowardly—brave (5) beautiful—ugly ..... (_____)

26. If the first two of the following sentences are true, the third is (?). Successful men work hard. Jones works hard. Jones is a successful man.
(1) true (2) false (3) not certain ..... (_____)

27. What number is missing in this series?
11 — 18 — 16 — 23 — 21 — (?)..... (_____)

28. Which of the following pairs of words have OPPOSITE meanings?
(1) exalt—rejoice (2) certify—attest (3) incite—quell
(4) tiny—minute (5) analogous—similar ..... (_____)

29. During a particular week John worked 1-3/4 days and 2-1/2 days. George worked 1-1/2 and 2-2/3 days. How many more days did John work than George?..... (_____)

30. If two diagonals are drawn across a square, how many large and small triangles will be formed?..... (_____)

31. You have a nickel, a dime, and a quarter. A clerk shows you several articles, each a different price and any one of which you could purchase with your coins without receiving change. What is the largest number of articles he could have shown you? ..... (_____)

32. What is the third letter of a six-letter word beginning with "R" and meaning "to lie at rest?"..... (_____)

33. What number is missing in this series?
15-2/3 15-1/3 15-2/3 15 15-2/3 14-2/3 (?)..... (_____)

34. What is the first letter of a five-letter word meaning avocation?..... (_____)

35. Ten books, each two inches thick, are arranged on a library shelf. How many inches are there between the front cover of the second book and the back cover of the seventh book? ..... (_____)

SCORE_____

PERCENTILE_____

NAME_____ DATE_____
(Last) (First)

Some jobs require figuring—such as adding, subtracting, multiplying, and dividing—while others require writing reports or answering letters, and still other jobs can be done well by people who are not particularly apt with figures or words. This test will help in determining how well you can handle jobs that require these abilities.

Do as well as you can on this test, but do not worry about it. Remember that you may be well qualified for certain jobs that require training or skills different from those covered in this test.

HERE IS A SAMPLE QUESTION:

Which of the words below tells what an orange is?
(1) animal (2) flower (3) fruit (4) vegetable (5) cloth.....(3)

The correct answer is "fruit." Since the word "fruit" is number (3), the number (3) has been written in the blank space at the right.

NOW LOOK AT THIS QUESTION:

What is the seventh letter in the alphabet?.....(G)

The seventh letter in the alphabet is G, so the letter G has been written in the blank at the right.

NOW, WRITE THE ANSWER TO THIS QUESTION YOURSELF:

If one pencil costs 5c, how many cents will six pencils cost?.....(_____)

The answer to this question is 30, so you should have written the number 30 in the blank at the end of the question.

TRY THIS ONE:

What is the first letter of a three-letter word meaning a tool used by carpenters to cut wood?
.....(_____)

The word of course is "saw," so the letter S should be written in the blank at the end of the question. All of the questions in this test are similar in form to those given above.

REMEMBER:

1. If the answer to a question is a LETTER or a NUMBER, write the letter or number in the blank at the end of the question.
2. If several answers are suggested (as in the first question above), write the NUMBER of the correct answer in the blank at the end of the question.

Work as rapidly as you can without making unnecessary mistakes. You will not be able to answer all of the questions. When you find a question you cannot answer, do not spend too much time on it, but go on to the next question. Do not skip around, but take all of the problems in order.

DO NOT TURN THE PAGE UNTIL TOLD TO DO SO

Reorder No. 7-111

1972 SUPERMARKET MANAGEMENT MANPOWER PROJECTION

In an effort to project 1972 supermarket management needs for Columbia, Missouri, the base was 1960. 1960 was used because it was the threshold of the rapid supermarket industry growth in Columbia.

In 1960 there were seven supermarkets operating in Columbia; with the end of 1971, there were fifteen. There will be no attempt made here to reason why this expansion took place; rather a simple statement that it did occur. This meant an increase of eight stores in eleven years. From this point on the material will concern itself with only the management people needed to make this industry operate.

In 1960 the basic management need of a supermarket was a store manager, assistant store manager, and four department managers. The four basic departments were grocery, produce, meat, and dairy.

Therefore;

6 management people
x 7 stores

Total 42 management people needed in 1960

During the eleven year period 1961 through 1971, there was a net increase of eight stores. This equaled a total of fifteen supermarkets in 1971. Assuming that the need was still six management people per store, the industry needed ninety management persons within this period.

6 management people

x 15 stores

Total 90 management people by 1971

Some industry changes took place within those eleven years, and six additional departments were added to the basic four departments of 1960. These new departments included bakery, delicatessen, drug, liquor, flower, and restaurant. There were now ten departments per store, so the industry actually needed 180 management people to operate the fifteen supermarkets instead of ninety.

This 180 projection did not include people to replace those who moved, retired, found other work, or left for other reasons. This loss was projected at one person per store per year; therefore, the need for this purpose was 100 management people over the eleven year period. The total projection for 1971 was 280 management people.

Of the 280 management people, thirty were store managers and assistant managers. Removing them from this list leaves 250 department management people needed. In conversations with the author, six store managers and eight department managers agreed that a new department manager with the right qualifications could be trained in one year. Such training of new management manpower could have equaled 644 management people in the time period from 1961 through 1971. The following chart explains how this figure tabulated.

Year	No. Stores	No. Dept. per Store	Total No. Dept. all Stores		Based on 1 man/Dept. Trained per Year, No. Total Men Trained Accumulative
1961	7	4	28	=	28
1962	7	4	28	=	56 - 6 new management people needed for one new store 50
1963	8	4	32	=	82 now available - 7 management for new store - 8 to cover new dept. 8 stores 67
1964	9	5	45	=	112 now available - 7 management for new store 105
1965	10	5	50	=	155 now available - 8 management for new store - 10 management for new dept. 10 stores 137
1966	11	6	66	=	203 now available
1967	11	6	66	=	266 now available - 9 management for new store - 11 management for new dept. 11 stores 249
1968	12	7	84	=	333 now available - 10 management for new store - 12 management for new dept. 12 stores 311

Year	No. Stores	No. Dept. per Store	Total No. Dept. all Stores		Based on 1 man/Dept. Trained per Year, No. Total Men Trained Accumulative
1969	13	8	104	=	405 now available - 11 management for new store - 13 management for new dept. 13 stores 381
1970	14	9	126	=	507 now available - 12 management for new store - 14 management for new dept. 14 stores 481
1971	15	10	150	=	631 now available

However, according to the same six store managers and eight department managers, a store considered itself to be doing a good job if it could train one new man per year per store. This meant two things:

1. At best, loss per store per year equaled the newly trained managers.
2. Therefore, as the industry grew there were no management reserves upon which to draw to supply new stores.

This brings one to the conclusion that many of the store departments were being managed by people who may or may not have been trained for their positions. By looking at the body of this paper, one can see that one-third of the existing produce managers were not qualified for their positions. This means one-third of the department managers were not

qualified to train new managers. Another one-third could perform their management work, but probably lacked the ability to train others. This left the top one-third of the managers to do the training. Under the previously mentioned rate of growth, with the top one-third of the managers doing the training, the industry could about maintain itself.

This did not work in reality because people with the necessary qualifications were neither quickly nor easily identified. The industry, therefore, was constantly attempting to recruit new management people.

At this point the author projected that if the industry moved to the use of the Leadership Questionnaire plus the Tiffin-Lawshe Adaptability Test plus interviews, those department employees with management potential could be easily and quickly identified. This being the case, the industry would be able to meet its ever-increasing need for new managers and possibly, over time, build up a slight reserve.

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